

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 Claim 1 (currently amended): A focusing apparatus  
2 comprising:  
3 a distance-measuring device which measures distances  
4 of a plurality of points in a photographing field based  
5 on a principle of triangular distance measurement to  
6 detect a subject which is the closest to the focusing  
7 apparatus, of subjects in the photographing field;  
8 a photographing lens;  
9 a driving mechanism which drives the photographing  
10 lens along an optical axis;  
11 an image pickup device which receives a subject  
12 light flux incident via the photographing lens to output  
13 a subject image signal; and  
14 a CPU which controls the driving mechanism to drive  
15 the photographing lens along the optical axis, ~~while~~  
16 thereby detecting a contrast of the subject image signal  
17 in a plurality of image pickup areas corresponding to the  
18 plurality of points and ~~which~~ thereafter adjusts a focal  
19 position of the photographing lens in a position which  
20 has a highest contrast of the subject image signal in an  
21 image pickup area corresponding to a point indicating a  
22 shortest distance of an output of the distance-measuring  
23 device in the plurality of points.

1 Claim 2 (original): The apparatus according to claim 1,  
2 wherein the distance-measuring device detects a  
3 brightness in the plurality of points, and

4 the image pickup device sets an integration  
5 time in the plurality of image pickup areas based on the  
6 detected brightness.

Claims 3 and 4 (canceled)

1 Claim 5 (currently amended): A focusing apparatus  
2 comprising:  
3 an image pickup device including a plurality of  
4 image pickup areas;  
5 a focusing lens including an optical path via which  
6 a subject light flux is incident upon the image pickup  
7 device;  
8 a focusing section which determines a plurality of  
9 focusing lens positions from a relation between the  
10 position of the focusing lens and a contrast of a subject  
11 image signal obtained on the image pickup device via the  
12 focusing lens;  
13 a distance-measuring section which obtains the  
14 position of a subject in a photographing field and a  
15 distance to the subject ~~by the subject light flux~~  
16 ~~incident via an optical path different from that of the~~  
17 ~~focusing lens; and~~  
18 a calculation control section which obtains a  
19 plurality of combinations of the focusing lens position  
20 and the image pickup area for use at the time of the  
21 focusing by the position and distance of the subject  
22 obtained by the distance-measuring section; and  
23 a control section which stops the focusing lens in  
24 the plurality of focusing lens positions in accordance  
25 with the plurality of combinations and which obtains the  
26 contrast of the subject image signal outputted from the

27 image pickup area of the combination corresponding to  
28 each focusing lens position and the contrast of the  
29 subject image signal outputted from the image pickup  
30 device in all the areas of the image pickup device to  
31 determine the position of the focusing lens.

Claim 6 (canceled)

1 Claim 7 (original): The apparatus according to claim 5,  
2 wherein the distance-measuring section includes a divided  
3 sensor array, and determines charge accumulation  
4 conditions of the image pickup device at the time of the  
5 obtaining of a change in the contrast by the output of  
6 the sensor array disposed in the distance-measuring  
7 section.

1 Claim 8 (currently amended): A focusing apparatus  
2 comprising:  
3 a photographing lens;  
4 an image pickup section which ~~detects~~ outputs a  
5 subject image incident via the photographing lens, and  
6 detects contrast information regarding an entire area of  
7 a photographing field and part of the entire area of the  
8 photographing field;  
9 ~~an optical system which is different from the~~  
10 ~~photographing lens,~~  
11 a distance-measuring section which ~~uses the optical~~  
12 ~~system different from the photographing lens to measure a~~  
13 ~~subject distance of~~ performs measurement to determine a  
14 focal position with respect to a plurality of points in a  
15 photographing field; and

16 a determining section which ~~focuses~~ moves the  
17 photographing lens ~~on~~ to a plurality of focal positions  
18 corresponding to a plurality of distance measurement  
19 results of the distance-measuring section and which  
20 determines an area to execute a final mountain climbing  
21 AF based on ~~contrasts obtained at the plurality of focal~~  
22 ~~positions and the distance measurement results~~ the  
23 contrast information detected by the image pickup section  
24 and the focal position determined by the distance  
25 measuring section.

1 Claim 9 (currently amended): A camera including a  
2 focusing apparatus, comprising:  
3 an irradiation device which selectively switches  
4 irradiation and non-irradiation of a subject with an  
5 auxiliary light for distance measurement;  
6 a photographing lens;  
7 a driving circuit which drives the photographing  
8 lens along an optical axis direction;  
9 an image pickup device which receives a light flux  
10 incident from the subject via the photographing lens to  
11 output a subject image signal;  
12 an image processing circuit which processes the  
13 subject image signal outputted from the image pickup  
14 device;  
15 a distance-measuring device which includes a pair of  
16 optical systems and a pair of sensors for distance  
17 measurement to detect a plurality of subject images  
18 incident via the pair of optical systems and which  
19 outputs information associated with a subject distance  
20 based on the plurality of subject images detected by the  
21 sensors for distance measurement and which detects the

22 plurality of subject images in a case where the subject  
23 has a low brightness; and  
24 a CPU which selectively executes a first auto-focus  
25 operation of detecting a contrast state based on the  
26 subject image signal processed by the image processing  
27 circuit to adjust a focus of the photographing lens, a  
28 second auto-focus operation of performing a  
29 distance-measuring operation by the distance-measuring  
30 device in a non-irradiation state of the auxiliary light  
31 for distance measurement to adjust the focus of the  
32 photographing lens in accordance with a result of the  
33 distance-measuring operation, and a third auto-focus  
34 operation of performing the distance-measuring operation  
35 by the distance-measuring device in an irradiation state  
36 of the auxiliary light for distance measurement to adjust  
37 the focus of the photographing lens in accordance with  
38 the result of the distance-measuring operation,  
39 wherein the CPU first executes the second auto-focus  
40 operation, and then executes the first auto-focus  
41 operation, when the main subject is separated from the  
42 camera by a distance shorter than a predetermined  
43 distance after the second auto-focus operation, and  
44 executes the third auto-focus operation, when an output  
45 of each of the sensors for distance measurement has a  
46 level lower than a predetermined level after the second  
47 auto-focus operation.

1 Claim 10 (original): The camera according to claim 9,  
2 wherein the CPU judges whether or not the subject  
3 indicates the low brightness and executes any of the  
4 first, second, and third auto-focus operations in  
5 accordance with the result of the judgment.

1 Claim 11 (original): The camera according to claim 10,  
2 wherein the CPU executes the second auto-focus operation  
3 and judges that the subject indicates the low brightness,  
4 when the output of the sensors for distance measurement  
5 indicate a level not more than a predetermined level as a  
6 result of the second auto-focus operation.

1 Claim 12 (original): The camera according to claim 11,  
2 wherein the CPU executes the third auto-focus operation,  
3 when the subject is judged to indicate the low  
4 brightness.

1 Claim 13 (original): The camera according to claim 9,  
2 wherein the CPU executes the second auto-focus operation,  
3 and executes the first auto-focus operation, when the  
4 subject is judged to exist in a distance shorter than a  
5 predetermined distance.

1 Claim 14 (currently amended): A camera including a  
2 focusing apparatus, comprising:  
3 a photographing lens;  
4 an image pickup device which picks up a subject  
5 image by using the photographing lens;  
6 a first auto-focus section which adjusts a focus of  
7 the photographing lens based on a contrast of a subject  
8 image obtained via the photographing lens;  
9 ~~a pair of optical systems which are different from~~  
10 ~~the photographing lens;~~  
11 a second auto-focus section which adjusts the focus  
12 of the photographing lens based on a pair of subject  
13 images obtained via the pair of optical systems;

14 a flash light irradiating section which irradiates a  
15 subject with a flash light;  
16 a judging section which judges whether or not an  
17 auto-focus operation by the first auto-focus section is  
18 appropriate, based on contrast of the subject images; and  
19 a control section which operates the first  
20 auto-focus section, when the judging section judges that  
21 the auto-focus operation by the first auto-focus section  
22 is appropriate and which operates both the second  
23 auto-focus section and the flash light irradiating  
24 section, when the judging section judges that the  
25 auto-focus operation by the first auto-focus section is  
26 inappropriate.

Claims 15-20 (canceled)

1 Claim 21 (currently amended): A camera including a  
2 focusing apparatus, comprising:  
3 a photographing lens;  
4 an image pickup device which acquires a subject  
5 image signal via the photographing lens;  
6 a first auto-focus section which performs focusing  
7 of the photographing lens based on a contrast of the  
8 subject image signal acquired by the image pickup device;  
9 ~~a pair of optical systems which are different from~~  
10 ~~the photographing lens,~~  
11 a distance-measuring device which uses a pair of  
12 subject image signals acquired via ~~the~~ a pair of optical  
13 systems to perform distance measurement;  
14 a second auto-focus section which performs the  
15 focusing of the photographing lens in accordance with a

16 distance measurement result of the distance-measuring  
17 device;  
18 a flash light irradiating section which irradiates a  
19 subject with a flash light;  
20 a judging section which judges whether or not the  
21 pair of subject image signals obtained via the pair of  
22 optical systems or the subject image signal acquired by  
23 the image pickup device is appropriate for a  
24 distance-measuring operation of the distance-measuring  
25 device; and  
26 a control section which irradiates the subject with  
27 the flash light in accordance with a judgment result of  
28 the judging section by the flash light irradiating  
29 section and which performs the focusing of the  
30 photographing lens preferentially by the second  
31 auto-focus section.

1 Claim 22 (original): A camera including a focusing  
2 apparatus, comprising:  
3 a flash section which irradiates a subject with  
4 an auxiliary light;  
5 a photographing lens;  
6 a contrast type focusing section which acquires  
7 a subject image signal at the time of displacement of the  
8 photographing lens by a micro amount via the  
9 photographing lens and which determines a focusing  
10 position in accordance with a contrast change of the  
11 acquired subject image signal to control the focusing of  
12 the photographing lens;  
13 an optical system which is different from the  
14 photographing lens;



15 a distance-measuring section which acquires  
16 a plurality of subject image signals via the optical  
17 system different from the photographing lens to measure a  
18 distance of the subject based on the acquired plurality  
19 of subject image signals; and  
20 a control section which determines whether to  
21 continue focusing control by the contrast type focusing  
22 section or to change to the focusing control to determine  
23 the focusing position based on the distance measured by  
24 the distance-measuring section, based on the plurality of  
25 subject image signals acquired by the distance-measuring  
26 section when the subject is irradiated with the auxiliary  
27 light by the flash section.

1 Claim 23 (original): The camera according to claim 22,  
2 wherein the control section controls the irradiation of  
3 the subject with the auxiliary light by the flash section  
4 and controls the focusing by the contrast type focusing  
5 section, when the distance of the subject measured by the  
6 distance-measuring section is shorter than  
7 a predetermined value at the time of the irradiation with  
8 the auxiliary light by the flash section, and the  
9 contrast of the plurality of subject image signals  
10 acquired by the distance-measuring section is larger than  
11 a predetermined value.

1 Claim 24 (original): A camera including a focusing  
2 apparatus, comprising:  
3 a photographing lens;  
4 a driving mechanism which drives the photographing  
5 lens along an optical axis direction;

6 an image pickup device which receives a subject  
7 light flux incident via the photographing lens to output  
8 the subject image signal;  
9 an image processing circuit which processes the  
10 subject image signal outputted from the image pickup  
11 device;  
12 a distance-measuring device which includes a pair of  
13 optical systems and a pair of sensors for distance  
14 measurement to detect a pair of subject images incident  
15 via the pair of optical systems and which outputs  
16 information associated with a subject distance based on  
17 the subject images detected by the sensors for distance  
18 measurement; and  
19 a CPU which detects the subject image signal  
20 processed by the image processing circuit or a brightness  
21 distribution of the pair of subject images detected by  
22 the sensors for distance measurement to select either one  
23 of the first and second auto-focus operations based on  
24 the detection result and which selectively executes a  
25 first auto-focus operation of detecting a contrast based  
26 on the subject image signal processed by the image  
27 processing circuit to adjust a focus of the photographing  
28 lens, and a second auto-focus operation of performing a  
29 distance-measuring operation by the distance-measuring  
30 device to adjust the focus of the photographing lens in  
31 accordance with a result of the distance-measuring  
32 operation.

1 Claim 25 (currently amended): A camera including a  
2 focusing apparatus, comprising:  
3 a photographing lens including a diaphragm  
4 mechanism;

5 an image pickup section which includes an image  
6 pickup device to photograph a subject image incident via  
7 the photographing lens to obtain a subject image signal;  
8 a setting section which sets conditions of an image  
9 pickup operation by the image pickup section;  
10 a first auto-focus section which focuses the  
11 photographing lens from a contrast of the subject image  
12 signal obtained by the image pickup section;  
13 ~~a pair of optical systems for distance measurement~~  
14 ~~which are different from the photographing lens;~~  
15 a distance-measuring section which includes a pair  
16 of sensors for distance measurement to acquire a pair of  
17 subject image signals via the a pair of optical systems  
18 for distance measurement and which performs a  
19 distance-measuring operation to calculate a subject  
20 distance from the pair of subject image signals;  
21 a second auto-focus section which focuses the  
22 photographing lens based on the distance measurement  
23 result of the distance-measuring section;  
24 a selecting section which detects the subject image  
25 signal obtained by the image pickup device or a  
26 brightness distribution of the pair of subject image  
27 signals obtained by the sensors for distance measurement  
28 to select either one of the first and second auto-focus  
29 sections in accordance with a ratio of a low-brightness  
30 portion in the detected brightness distribution; and  
31 a change section which changes the conditions of the  
32 distance-measuring operation set by the setting section,  
33 when the selecting section selects the second auto-focus  
34 section.

1 Claim 26 (original): The camera according to claim 25,  
2 wherein the conditions of the image pickup operation set  
3 by the setting section include at least aperture value  
4 information of the diaphragm mechanism, shutter speed  
5 information of a shutter to expose an image pickup plane  
6 of the image pickup device, and sensitivity information  
7 of the image pickup device.

8  
9 Claim 27 (original): The camera according to claim 26,  
10 wherein the change section changes the aperture value  
11 information and the sensitivity information set by the  
12 setting section.

1 Claim 28 (original): The camera according to claim 27,  
2 wherein the change section the aperture value information  
3 so as to narrow down the diaphragm mechanism by a value  
4 larger than that in the aperture value information set by  
5 the setting section and changes the sensitivity of the  
6 image pickup device so as to raise the sensitivity of the  
7 image pickup device.

1 Claim 29 (currently amended): A camera including a  
2 focusing apparatus, comprising:  
3 a photographing lens;  
4 a first auto-focus section which includes an image  
5 pickup device to obtain a contrast of a subject image  
6 signal obtained via the photographing lens and which  
7 adjusts a focus of the photographing lens based on the  
8 contrast of the subject image signal obtained by the  
9 image pickup device;  
10 ~~a pair of optical systems which are different from~~  
11 ~~the photographing lens;~~

12           a second auto-focus section which includes  
13   a distance-measuring device to perform a  
14   distance-measuring operation based on a pair of subject  
15   image signals obtained via ~~the~~ a pair of optical systems  
16   and which adjusts the focus of the photographing lens in  
17   accordance with the output of the distance-measuring  
18   device;  
19           a detecting section which detects the subject image  
20   signal obtained by the image pickup device or a  
21   brightness distribution of the pair of subject image  
22   signals obtained by the distance-measuring device; and  
23           a change section which selects the second auto-focus  
24   section in accordance with a ratio of a low-brightness  
25   portion of a brightness distribution detected by the  
26   detecting section and which changes an aperture value of  
27   the diaphragm mechanism in the photographing lens and a  
28   sensitivity of the image pickup device.

Claims 30-32 (canceled)